

Claims

1. A method of forming a welded structure comprising:
arranging on constituent pieces of the structure to be welded on a support surface in a desired configuration,
recording at least one image of the arrangement of the constituent pieces on the support surface,
determining from the image(s) the positions of a plurality of weld points,
welding with welding apparatus the constituent pieces together at said weld points to form the welded structure, and
controlling the welding of the constituent pieces with said welding apparatus on the basis of the determined positions of the weld points.
2. A method according to claim 1, comprising recording the at least one image in memory of a reader apparatus.
3. A method according to claim 1, comprising recording the at least one image in memory of the camera means (3) and/or in memory of the welding apparatus (4) and/or in a combined memory for the camera means (3) and the welding apparatus (4).
4. A method according to claim 1, comprising recording the at least one image in memory of an external device (17).
5. A method according to claim 1, wherein the method further comprises displaying the positions of the weld points on a display device for assisting a user to control guiding of the welding apparatus.
6. A method according to claim 1, comprising providing a user with the ability to override automatic control of the welding of the constituent pieces.

7. A method according to claim 1, comprising using control information to guide movement of the welding apparatus.

8. A method according to claim 1, comprising welding the structure automatically or semi-automatically.

9. A method according to claim 1, comprising welding the constituent pieces together using a welding robot or a manipulator.

10. A method according to claim 1, comprising determining the positions of the weld points are determined from the at least one image either automatically or with the assistance of a user.

11. A method according to claim 10, further comprising determining the type of welding of each weld point and determining whether the welding should be performed manually, semi-automatically or automatically.

12. A method according to claim 1, comprising welding the constituent pieces together by arc welding, e.g. gas arc welding.

13. A method according to claim 1, comprising guiding the welding apparatus to follow the shape or form of the structure during the welding.

14. A method of forming a large welded structure, for example a part or parts of a ship, a paper machine, a building, a train or a truck, comprising:

arranging constituent pieces of the structure to be welded on a support surface in a desired configuration,
recording at least one image of the arrangement of the constituent pieces on the support surface,

determining from the image(s) the positions of a plurality of weld points,

welding with welding apparatus the constituent pieces together at said weld points to form the welded structure, and

controlling the welding of the constituent pieces with said welding apparatus on the basis of the determined positions of the weld points.

15. A welding arrangement for forming a welded structure from a plurality of constituent pieces, comprising a support surface for supporting the constituent pieces in the configuration of a structure to be welded,

camera means for providing an image of the structure to be welded,

evaluating means for determining the positions of weld points of the structure to be welded based on the image provided by the camera means,

welding apparatus for welding together the constituent pieces of the structure at the positions of the weld points determined by the evaluating means.

16. A welding arrangement according to claim 15, wherein the evaluating means includes means for identifying the constituent pieces of the structure to be welded and for determining the optimal method of welding the identified constituent pieces.

17. A welding arrangement according to claim 15, including control means for guiding the welding apparatus during welding of a structure.

18. A welding arrangement according to claim 15, including override means for allowing a user to override control of the welding apparatus.

19. A welding arrangement according to claims 15, including override means for a user either to accept or to reject automatic control of the welding apparatus and to

control the welding of a part or parts of the structure if automatic control is rejected.

20. A method of welding a structure composed of a number of constituent pieces, comprising:

identifying optimal weld points for joining the pieces
of the structure, and
guiding welding apparatus to the weld points.

21. A method according to claim 20, further comprising using the welding apparatus to form a welds at the respective weld points.

22. A method according to claim 20, further comprising rejecting a weld point to which the welding apparatus has been guided and guiding the welding apparatus to another weld point.